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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/690,580 10/17/00 VASHCHENKO

V NSC1-H1500

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MM91/1024

EXAMINER

FARAHANT, D

ART UNIT

PAPER NUMBER

2814

DATE MAILED:

10/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

| | | | |
|--|---------------------------|---|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/690,580 | VASHCHENKO ET AL. | |
| | Examiner Dana Farahani | Art Unit 2814 | |
| <i>-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --</i> | | | |
| Period for Reply | | | |
| A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION. | | | |
| <ul style="list-style-type: none"> - Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication. - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely. - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication. - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). - Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b). | | | |
| Status | | | |
| 1) <input checked="" type="checkbox"/> Responsive to communication(s) filed on <u>10 October 2000</u> . | | | |
| 2a) <input type="checkbox"/> This action is FINAL . | | 2b) <input checked="" type="checkbox"/> This action is non-final. | |
| 3) <input type="checkbox"/> Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under <i>Ex parte Quayle</i> , 1935 C.D. 11, 453 O.G. 213. | | | |
| Disposition of Claims | | | |
| 4) <input checked="" type="checkbox"/> Claim(s) <u>1-8</u> is/are pending in the application. | | | |
| 4a) Of the above claim(s) _____ is/are withdrawn from consideration. | | | |
| 5) <input type="checkbox"/> Claim(s) _____ is/are allowed. | | | |
| 6) <input checked="" type="checkbox"/> Claim(s) <u>1-8</u> is/are rejected. | | | |
| 7) <input type="checkbox"/> Claim(s) _____ is/are objected to. | | | |
| 8) <input type="checkbox"/> Claim(s) _____ are subject to restriction and/or election requirement. | | | |
| Application Papers | | | |
| 9) <input type="checkbox"/> The specification is objected to by the Examiner. | | | |
| 10) <input type="checkbox"/> The drawing(s) filed on _____ is/are: a) <input type="checkbox"/> accepted or b) <input type="checkbox"/> objected to by the Examiner. <p style="margin-left: 20px;">Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).</p> | | | |
| 11) <input type="checkbox"/> The proposed drawing correction filed on _____ is: a) <input type="checkbox"/> approved b) <input type="checkbox"/> disapproved by the Examiner. <p style="margin-left: 20px;">If approved, corrected drawings are required in reply to this Office action.</p> | | | |
| 12) <input type="checkbox"/> The oath or declaration is objected to by the Examiner. | | | |
| Priority under 35 U.S.C. §§ 119 and 120 | | | |
| 13) <input type="checkbox"/> Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). <p style="margin-left: 20px;">a)<input type="checkbox"/> All b)<input type="checkbox"/> Some * c)<input type="checkbox"/> None of:</p> | | | |
| <p style="margin-left: 40px;">1.<input type="checkbox"/> Certified copies of the priority documents have been received.</p> | | | |
| <p style="margin-left: 40px;">2.<input type="checkbox"/> Certified copies of the priority documents have been received in Application No. _____.</p> | | | |
| <p style="margin-left: 40px;">3.<input type="checkbox"/> Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).</p> | | | |
| <p>* See the attached detailed Office action for a list of the certified copies not received.</p> | | | |
| 14) <input type="checkbox"/> Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application). <p style="margin-left: 20px;">a)<input type="checkbox"/> The translation of the foreign language provisional application has been received.</p> | | | |
| 15) <input type="checkbox"/> Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121. | | | |
| Attachment(s) | | | |
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ | |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) | |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | | 6) <input type="checkbox"/> Other: _____ | |

DETAILED ACTION

Drawings

1. The drawings are objected to because they are not suitable for reproduction.
Correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowrey (U.S. 5581104) et al. in view of Delage (U.S. 6031255) et al.

Lowrey discloses a bipolar transistor-based ESD protection structure comprising an N-type semiconductor substrate, figure 8, a bipolar transistor disposed in and on the semiconductor substrate, the bipolar transistor having a base region, shown as an N region, a collector region, shown as a P+ region connected to an input, and a polysilicon emitter P+ connected to Vcc. However Lowrey does not disclose a heat sink. Delage, in figure 9, discloses a heat sink region 101, integrated with the metal layer 94, adjacent to the emitter 40 and above the semiconductor substrate 10, in order to reduce the heat generated during an ESD event. Therefore it would have been obvious to one of

ordinary skill in the art at the time of the invention to use the heat sink Delage discloses in the Lowrey invention in order to reduce the heat generated.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lowrey and Delage as applied to claim 1, above, and further in view of Leuschner (U.S. 4724471). Delage, as applied to Lowrey, does not disclose the heat sink is formed of polysilicon. However, it is well known in the art that polysilicon layers are commonly used as heat sinks (see for example Leuschner, column 8, lines 16-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the heat sink Delage discloses from polysilicon in order to make a good heat sink.

5. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lowrey and Delage as applied to claim 1, above, and further in view of Akram (U.S. 6075288).

Regarding claims 3 and 4, Delage, as applied to Lowrey, does not disclose the heat sink region formed of metal layers. Akram describes a floating heat sink formed of copper, aluminum, molybdenum, titanium, and alloys of these materials. (see column 3, lines 40-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the heat sink Delage discloses from the material Akram describes in order to form a heat sink with a high thermal conductivity.

Regarding claim 5, Akram, as applied to claims 3 and 4 above, does not disclose the heat sink is within 2 microns of the polysilicon emitter. However, it would have been

an obvious matter of design choice to those skilled in the art to dispose the heat sink region within 2 microns of the polysilicon emitter since heat transfer by conduction is more efficient.

6. Claims 7 and 8 are rejected as being unpatentable over Lowrey and Delage as applied to claims 1 above and further in view of applicant's Admitted Prior Art. Lowrey does not include a Zener Triggered bipolar transistor-based ESD protection and a grounded base configuration bipolar transistor. However, in the applicant's Admitted Prior Art (see page 2, line 21), the applicant has disclosed that these configurations are commonly used in the art for transistor based ESD structures. Therefore it would have been obvious to one of ordinary skills in the art at the time the invention was made to include a grounded base configuration bipolar transistor and a Zener Triggered bipolar transistor in the Lowrey invention in order to conduct the ESD current to a substrate or ground.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3432 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani
October 16, 2001



OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800